

## CLAIMS

What is claimed is:

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1. A two-way broadband system, comprising:

a digital headend configured to process a plurality of digital video, a plurality of digital data, a plurality of voice information, and a plurality of upstream communications, said digital headend including,

10 at least one smart network interface module configured to buffer said plurality of digital video, said plurality of digital data, said plurality of voice information and said plurality of upstream communications,

15 a shared bus operatively coupled to said at least one smart network interface module, said shared bus configured to transport said digital video, said plurality of digital data, said plurality of voice information, and said plurality of upstream communications,

20 a downstream module operatively coupled to said shared bus, said downstream module configured to transmit said plurality of digital video, said plurality of digital data and said plurality of voice information,

an upstream module operatively coupled with said shared bus, said upstream configured to receive said plurality of upstream communications;

a cable distribution network in communications with said digital headend, said cable distribution network configured to communicate a plurality of digital video, a plurality of digital data, a plurality of voice information, and a plurality of upstream communications; and

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a set-top box configured to receive said plurality of video, said plurality of data, said plurality of voice information, said set-top box configured to generate said plurality of upstream communications.

10 2. The two-way broadband system of claim 1 wherein said at least one smart network interface module is operatively coupled to a control computer, said control computer configured to perform content management and resource allocation.

15 3. The two-way broadband system of claim 2 wherein said at least one smart network interface module is operatively coupled to a service computer, said service computer configured to manage conditional access.

20 4. The two-way broadband system of claim 3 wherein said at least one smart network interface module is operatively coupled to a video server, said video server configured to provide local storage for digital video.

5. The two-way broadband system of claim 4 wherein said at least one smart network interface module is operatively coupled to an Internet computer, said Internet computer configured to communicate Internet data.

5 6. The two-way broadband system of claim 5 wherein said at least one smart network interface module is operatively coupled to a telephony computer, said telephony computer configured to communicate telephony data.

7. The two-way broadband system of claim 6 wherein said telephony computer comprises a switched telephony system, said switched telephony system configured to communicate telephony data.

8. The two-way broadband system of claim 6 wherein said telephony computer comprises a Voice over IP system, said Voice over IP system configured to communicate telephony data.

9. The two-way broadband system of claim 6 wherein said at least one smart network interface module is configured to optimize the transfer of a plurality of bits associated with said plurality of digital video, said plurality of digital data, said plurality of voice information and said plurality of upstream communications across said shared bus.

10. The two-way broadband system of claim 1 wherein said at least one smart network interface module is configured to buffer said plurality of digital video, said plurality of digital data, said plurality of voice information and said plurality of upstream communications.

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11. The two-way broadband system of claim 10 wherein said at least one smart network interface module is configured to buffer a plurality of digital video control data associated with said plurality of digital video.

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12. The two-way broadband system of claim 12 wherein said at least one smart network interface module is configured to buffer a plurality of digital data control data associated with said plurality of digital data.

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15. The two-way broadband system of claim 13 wherein said at least one smart network interface module is configured to buffer a plurality of voice information control data associated with said plurality of voice information.

14. The two-way broadband system of claim 14 wherein said at least one smart network interface module is configured to buffer a plurality of upstream communications control data associated with said plurality of upstream communications.

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15. A two-way broadband system, comprising:

a digital headend configured to process a plurality of digital video, a plurality of digital data, and a plurality of upstream communications, said digital headend including,  
5 at least one smart network interface module configured to buffer said plurality of video, said plurality of digital data, and said plurality of upstream communications,  
a shared bus operatively coupled to said smart network interface module, said shared bus configured to transport said digital video, said plurality of digital data, and said plurality of upstream communications,  
10 a downstream module operatively coupled to said shared bus, said downstream module configured to transmit said plurality of digital video and said plurality of digital data,  
15 an upstream module operatively coupled with said shared bus, said upstream configured to receive said plurality of upstream communications;  
a cable distribution network in communications with said digital headend, said cable distribution network configured to communicate a plurality of digital video, a plurality of digital data, and a plurality of upstream communications; and  
20 a set-top box configured to receive said plurality of video, said plurality of data, said plurality of voice information, said set-top box configured to generate said plurality of upstream communications.

16. The two-way broadband system of claim 15 wherein said smart network interface module is operatively coupled to a control computer, said control computer configured to perform content management and resource allocation.

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17. The two-way broadband system of claim 16 wherein said smart network interface module is operatively coupled to a service computer, said service computer configured to configured to manage conditional access.

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18. The two-way broadband system of claim 17 wherein said smart network interface module is operatively coupled to a video server, said video server configured to provide local storage for digital video.

19. The two-way broadband system of claim 18 wherein said smart network interface module is operatively coupled to an Internet computer, said Internet computer configured to communicate Internet data.

20. The two-way broadband system of claim 19 wherein said at least one smart network interface module is configured to optimize the transfer of a plurality of bits associated with said plurality of digital video, said plurality of digital data, said plurality of voice information and said plurality of upstream communications across said shared bus.

21. The two-way broadband system of claim 15 wherein said at least one smart  
network interface module is configured to buffer said plurality of digital video, said  
plurality of digital data, said plurality of voice information and said plurality of upstream  
communications.

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22. The two-way broadband system of claim 21 wherein said at least one smart  
network interface module is configured to buffer a plurality of digital video control data  
associated with said plurality of digital video.

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23. The two-way broadband system of claim 22 wherein said at least one smart  
network interface module is configured to buffer a plurality of digital data control data  
associated with said plurality of digital data.

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24. The two-way broadband system of claim 23 wherein said at least one smart  
network interface module is configured to buffer a plurality of voice information control  
data associated with said plurality of voice information.

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25. The two-way broadband system of claim 24 wherein said at least one smart  
network interface module is configured to buffer a plurality of upstream communications  
control data associated with said plurality of upstream communications.

26. A digital headend configured to receive a plurality of digital video, a plurality of data signals, a plurality of voice information, and a plurality of upstream communications, said digital headend comprising:

5 a smart network interface module housed within said digital headend, said smart network interface module configured to buffer said plurality of video, said plurality of data, said plurality of voice information and said plurality of upstream communications;

a shared bus operatively coupled to said smart network interface module, said shared bus configured to transport said digital video, said plurality of digital data, said plurality of voice information, and said plurality of upstream communications;

10 a downstream module operatively coupled to said shared bus, said downstream module configured to communicate said plurality of digital video, said plurality of digital data and said plurality of voice information; and

15 an upstream module operatively coupled to said shared bus, said upstream module configured to receive said plurality of upstream communications and communicate said upstream communications to said shared bus.

27. The digital headend of claim 26 wherein said at least one smart network interface module is operatively coupled to a control computer, said control computer configured to perform content management and resource allocation.

28. The digital headend of claim 26 wherein said at least one smart network interface module is operatively coupled to a service computer, said service computer configured to manage conditional access.

5 29. The digital headend of claim 26 wherein said at least one smart network interface module is operatively coupled to a video server, said video server configured to provide local storage for digital video.

30. The digital headend of claim 26 wherein said at least one smart network interface module is operatively coupled to an Internet computer, said Internet computer configured to communicate Internet data.

31. The digital headend of claim 26 wherein said at least one smart network interface module is operatively coupled to a telephony computer, said telephony computer configured to communicate telephony data.

32. The digital headend of claim 31 wherein said telephony computer comprises a switched telephony system, said switched telephony system configured to communicate telephony data.

33. The digital headend of claim 31 wherein said telephony computer comprises a  
Voice over IP system, said Voice over IP system configured to communicate telephony  
data.

5 34. The digital headend of claim 26 wherein said at least one smart network interface  
module is configured to optimize the transfer of a plurality of bits associated with said  
plurality of digital video, said plurality of digital data, said plurality of voice information  
and said plurality of upstream communications across said shared bus.

10 35. The digital headend of claim 26 wherein said at least one smart network interface  
module is configured to buffer said plurality of digital video, said plurality of digital data,  
said plurality of voice information and said plurality of upstream communications.

15 36. The digital headend of claim 35 wherein said at least one smart network interface  
module is configured to buffer a plurality of digital video control data associated with  
said plurality of digital video.

20 37. The digital headend of claim 36 wherein said at least one smart network interface  
module is configured to buffer a plurality of digital data control data associated with said  
plurality of digital data.

38. The digital headend of claim 37 wherein said at least one smart network interface module is configured to buffer a plurality of voice information control data associated with said plurality of voice information.

5 39. The digital headend of claim 38 wherein said at least one smart network interface module is configured to buffer a plurality of upstream communications control data associated with said plurality of upstream communications.

10 40. A digital headend configured to receive a plurality of digital video, a plurality of data signals, and a plurality of upstream communications, said digital headend comprising:

15 a smart network interface module housed within said digital headend, said smart network interface module configured to buffer said plurality of video, said plurality of data, and said plurality of upstream communications;

20 a shared bus operatively coupled to said smart network interface module, said shared bus configured to transport said digital video, said plurality of digital data, and said plurality of upstream communications;

25 a downstream module operatively coupled to said shared bus, said downstream module configured to communicate said plurality of digital video and said plurality of digital data; and

an upstream module operatively coupled to said shared bus, said upstream module configured to receive said plurality of upstream communications and communicate said upstream communications to said shared bus.

5 41. The digital headend of claim 40 wherein said smart network interface module is operatively coupled to a control computer, said control computer configured to perform content management and resource allocation.

10 42. The digital headend of claim 41 wherein said smart network interface module is operatively coupled to a service computer, said service computer configured to manage conditional access.

15 43. The digital headend of claim 42 wherein said smart network interface module is operatively coupled to a video server, said video server configured to provide local storage for digital video.

44. The digital headend of claim 43 wherein said smart network interface module is operatively coupled to an Internet computer, said Internet computer configured to communicate Internet data.

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45. The digital headend of claim 44 wherein said at least one smart network interface module is configured to optimize the transfer of a plurality of bits associated with said

plurality of digital video, said plurality of digital data, said plurality of voice information and said plurality of upstream communications across said shared bus.

46. The digital headend of claim 40 wherein said at least one smart network interface  
5 module is configured to buffer said plurality of digital video, said plurality of digital data,  
said plurality of voice information and said plurality of upstream communications.

47. The digital headend of claim 46 wherein said at least one smart network interface  
module is configured to buffer a plurality of digital video control data associated with  
said plurality of digital video.

48. The digital headend of claim 47 wherein said at least one smart network interface  
module is configured to buffer a plurality of digital data control data associated with said  
plurality of digital data.

49. The digital headend of claim 48 wherein said at least one smart network interface  
module is configured to buffer a plurality of voice information control data associated  
with said plurality of voice information.

20 50. The digital headend of claim 49 wherein said at least one smart network interface  
module is configured to buffer a plurality of upstream communications control data  
associated with said plurality of upstream communications.